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PROBLEMS IN NEUROLOGICAL SURGERY*

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It is only within comparatively recent years that so-called surgical specialties have been developed. The youngest of these children of general surgery is neurological surgery—so young in fact that it is only within the past ten or fifteen years that its legs have become strong enough to permit a more or less independent existence. It is therefore quite proper for the medical profession to be kept informed concerning the problems and progress of this rather new line of surgical endeavor, as only by its works can its existence be justified.

It is quite true that intracranial tumors play a rather prominent role on the neurosurgical stage, yet there are other actors of considerable prominence who deserve more than a passing notice. For example, in three hundred and thirty-six potential neurosurgical cases studied during the year 1925 there were only forty-five cases of brain tumor. It is gratifying to note that only one of these cases had become totally blind at the time of admission to the hospital, a fact which speaks well for the diagnostic alertness of the present-day physician, for it has not been many years since a rather large number of such patients became totally blind before the true nature of the underlying lesion was even suspected.

The diagnosis of brain tumor is not such a difficult matter as many physicians imagine. An expanding lesion within the cranial cavity usually produces sooner or later an increased intracranial pressure of sufficient degree to give rise to definite symptoms, such as headaches, disturbance of vision due to edema of the optic discs, vomiting, generalized convulsions, drowsiness, mental dullness, and diplopia. The time of development of one or more of these symptoms will depend largely upon whether or not the passages through which the cerebrospinal fluid circulates are encroached upon early or late in the disease. It is thus possible for a tumor of the cerebrum to develop to an enormous size before giving rise to pressure symptoms; whereas a tumor located below the tentorium, through an early obstruction of the cerebrospinal fluid circulation, will usually produce early in its development an internal hydrocephalus with its attending symptoms.

When tumors are so located as to disturb brain areas of known function, either by direct involvement or by pressure, one can usually make a fairly accurate localizing diagnosis. This is frequently possible before the development of the distressing symptoms of increased intracranial pressure. It becomes, therefore, a matter of paramount importance for every physician to at least suspect the possibility of brain neoplasm in all cases presenting the gradual development of symptoms pointing to brain involvement. When this becomes the rule instead of the exception, these unfortunates will have a greater chance of improvement by the early institution of the proper treatment.

Unfortunately a certain percentage of tumors develop in the so-called silent areas of the brain, and do not manifest themselves until general pressure symptoms develop, and can not be localized by the usual diagnostic methods. Ventricular air injections followed by roentgen-ray study may then be resorted to as an additional diagnostic aid. This procedure, however, should not be lightly used as it is not without danger. Grant of Philadelphia collected the experiences of some twenty-two neurological surgeons and found that in a series of three hundred and ninety-two cases so studied, there was a mortality of eight and one-tenth per cent. One might justly argue that in a condition of such gravity as cerebral neoplasm, a diagnostic method with even a higher mortality incidence is entirely justifiable. I agree entirely with this stand, at the same time I would insist that ventricular air injections be reserved absolutely for those patients in which all other diagnostic methods have failed to give a reasonably accurate localization.

I fear that the medical profession has not been well informed in regard to the merits of the present-day methods of treating intracranial tumors. Before touching briefly on this phase of the subject I would like to sound a note of warning against the all too prevalent practice of institut-

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ing prolonged anti-syphilitic treatment on the presumption that the tumor may be of luetic origin. It so happens that gumma of the brain is of comparatively infrequent occurrence in spite of the prevailing contrary impression. On account of the danger of lumbar puncture in the presence of choked disc, an occasional case of central nervous system syphilis may be subjected to operation when the spinal fluid Wassermann reaction would have been positive had the fluid been examined. Even so, a so-called decompression operation for the relief of increased intracranial pressure due to syphilis is a therapeutic measure of recognized merit. The mistake (if the above is in reality a mistake) is all too often made in the opposite direction, in that patients with cerebral neoplasm are often subjected to unwarranted anti-syphilitic treatment, thereby permitting the tumor to make further inroads on important centers and the optic nerves to undergo secondary atrophic changes before the correct treatment is recommended or employed.

With the exception of tumors localized in the pons, central ganglia, and corpus callosum, all cases of intracranial neoplasm should be subjected to radical exposure by properly devised bone flap exploration (in case the cerebrum is involved), extensive removal of bone overlying the cerebellum (in posterior fossa tumors), and transphenoidal exposure in certain selected pituitary hyperplasias. The object of the radical exposure is to remove the tumor if possible. It so happens that only such encapsulated tumors as endotheliomas, circumscribed gliomas of the cortex, some gliomatous cysts, some chiasmal cysts, and acoustic nerve tumors, are those usually amenable to radical or subradical removal. This leaves a very large group, namely the large infiltrating gliomas, which can not be removed. When the latter lesion is found it is usually best treated by means of liberal decompression followed by radiation with the roentgen-ray. At times, when these tumors are very soft, the bulk of them can be removed by means of suction. Such removals, however, are in no sense complete, and should always be followed by decompression and radiation.

Bailey and Cushing in a recent publication (A Classification of the Tumors of the Glioma Group on a Histogenetic Basis with a Correlated Study of Prognosis: J. P. Lippincott Company) classify gliomas into fourteen groups, from a histogenetic standpoint. Their work is based on a study of some four hundred gliomas observed at operation or necropsy. They find that the brain gliomas represent about forty-two per cent of all intracranial neoplasms. In their study they adopt for these tumors a terminology consistent with that used for the histogenesis and normal structure of the brain. They find that the tumors whose cells reproduced the structure of the less differentiated cells in the developing central nervous system are much more malignant than are those tumors composed of more highly differentiated cells. They conclude, therefore, that the prognosis in cases of glioma of the brain does not depend so much on the removal or non-removal of the tumor as it does on the histogenetic character of the cells composing the tumor.

Be this as it may, all neurological surgeons have to their credit a goodly number of apparent cures of glioma of the brain, either as the result of complete excision, or of decompression followed by radiation. That the prognosis in these cases depends largely upon the relative malignancy or benignancy of the cells composing the tumor goes without saying. There is ample analogy in the results of the treatment of neoplasms in other portions of the body. What the medical profession is more interested in is the question: Are the results of surgery for intracranial tumors sufficiently good to warrant the continuation of this method of treatment? Speaking from my own experience and that of my colleagues I would answer unqualifiedly in the affirmative.

Brain Injuries.—Since the advent of the automobile the problem of injuries to the skull and its contents has become a most important one, not only to the neurological surgeon but to the general practitioner. I dare say there is hardly one of my hearers who has not been called upon to treat one or more such patients. It so happens that this type of case can rarely be referred to the large cities for treatment. It is of the utmost importance, therefore, for every physician to understand clearly the pathology and pathological physiology resulting from brain trauma so that he may be able to adopt a plan of treatment best suited to the individual case. I would like to speak briefly, therefore, of our own experience, in the hope that there may be some points of value to some of those present.

In the first place we have long since ceased to view such cases in terms of "fracture of the skull". Naturally it is of interest and importance

to know whether or not the skull is fractured. Of far more importance, however, is the question, "Is the brain injured? If so, to what extent, and what are to be our guides as to the best plan of treatment?" I have seen cases of extensive fracture of the skull with no evidence of brain injury whatsoever, and, on the other hand, cases of extensive brain laceration with no evidence of fracture. This can be readily understood when we remember that the skull is an irregular sphere, which will change its shape for an instant as the result of sudden forceful impact. The intracranial contents are instantaneously squeezed as it were and may or may not become damaged, regardless of whether the normal elasticity of the skull is exceeded or not.

In the second place, we have learned by experience that there are several types of head injuries, and that the character of treatment should differ accordingly. Before instituting treatment, therefore, we attempt to classify as far as is possible each case, and then apply the type of treatment which we believe is indicated for each individual patient. The preliminary examination consists of stereoscopic X-ray films, lumbar puncture so as to determine the spinal fluid pressure by means of a simple tube manometer, and the presence or absence of blood in the fluid; a brief neurological survey with particular attention to the pupils, retinal veins (which become engorged as the result of increased intracranial pressure), superficial and deep reflexes, and the various paralyses and spasticity; and repeated observation of the blood pressure, pulse and respiration. If this routine is followed one is usually able to estimate within reasonable limits the type and degree of injury. We have found that most cases fall into the following groups:

Class A.—Massive brain injury with evidence of exhaustion of the medullary centers, (vasomotor, cardio-inhibitory and respiratory) and death within one to several hours after admission. Such cases have extensive brain lacerations with rapid uncontrollable hemorrhage, and die regardless of any type of treatment.

Class B.—Middle meningeal hemorrhage. The history of such cases is usually typical. Following a temporary unconsciousness there is a lucid interval which gradually merges into coma. Repeated blood pressure readings give a gradual rise in pressure, the pulse becomes slow, and as the clot increases in size, pressure on the underlying brain will give rise to contralateral spasticity and paralysis, and not infrequently to convulsions with particular involvement of the contralateral face and extremities. An immediate operation is imperative in cases of this type. This is accomplished by a straight-line incision in the temporal region on the side of the suspected hemorrhage. The fibers of the temporal muscle are split, the muscle retracted to either side and the skull trephined. The clot will then be seen and the diagnosis verified. If the operator is skilled in the usual neuro-surgical technic, the bone under the temporal muscle may then be rongeured away, the clot removed, and the ruptured meningeal vessel ligated or the foramen spinosum plugged with wax. The dura should then be freely opened and the wound carefully closed in layers. A safer procedure for the average surgeon would be: first to ligate the external carotid artery after disclosing the epidural clot; then to proceed with the enlargement of the opening in the skull, removal of the clot, etc.

Class C.—Localized contusions as the result of simple or compound depressed fractures. The principle of debridement used during the World War should be applied in this class of cases. The edges of the scalp lacerations should be excised, the depressed fragments of bone removed and placed in salt solution, the dura incised if not already torn, and all devitalized brain carefully removed by means of catheter suction. The dura should then be sutured if possible, the bone defect filled with some of the removed fragments, and the scalp wound closed with fine galea and skin sutures. Unless these cases are so treated, meningitis, brain abscess or traumatic cyst are liable to develop.

Class D.—Rapidly increasing intracranial pressure with evidence of medullary compensation. Such cases usually have lacerations of the tips of the temporal lobes and undersurfaces of the frontal lobes. There is a sufficiently rapid intradural hemorrhage to give rise to signs and symptoms suggesting a rapidly increasing intracranial pressure. These cases are in a way a milder form of Class A. They are not very frequent as is shown by the fact that there were only five such patients in our recent series of some three hundred cases of head injury. The treatment indicated is a unilateral or bilateral subtemporal decompression, with evacuation and control of the intradural hemorrhage if possible. As a rule a rubber tissue wick should be left

under the frontal lobe and allowed to escape through the lower angle of the wound. Such drains should be removed in twenty-four hours.

Class E.—Definite evidence of brain injury without rapidly increasing intracranial pressure, yet of a type which experience has shown is liable to develop within a few days an increased intracranial pressure due to fluid accumulation. Approximately fifty per cent of all head injuries will fall into this group. There are usually more or less linear fractures on X-ray study, blood in the spinal fluid, altered superficial and deep reflexes, etc. The blood pressure remains normal, there is very little alteration in the pulse rate, and the unconsciousness is not deep. There is frequently terrific restlessness. These cases unquestionably have definite widespread brain contusion with a moderate degree of subarachnoid hemorrhage. An immediate operation is not indicated. If treated along the usual conservative lines many such cases will develop within a few days marked increased intracranial pressure due to a subdural accumulation of fluid. If such a condition is allowed to develop, late operation for release of the fluid may have to be done. We are thoroughly convinced by our own experience that such a condition can be prevented and all operations avoided if these patients are put on a so-called hypertonic treatment as soon as properly classified. The treatment which we use is as follows: When the patient can swallow and is not vomiting, he is given one-half ounce of a saturated solution of magnesium sulphate without water every two hours for the first twenty-four hours. The time of administration is then lengthened to every three hours for a day or so, the intervals being gradually lengthened until by the tenth day the drug is withdrawn entirely. Fluids in the form of glucose lemonade and orangeades, salty broths, etc., are given between administrations of the magnesium sulphate. When oral administration is impossible, three ounces of magnesium sulphate dissolved in six ounces of water is given by rectum every twelve to twenty-four hours. If neither oral nor rectal administration is possible ten cubic centimeters of a ten per cent solution of chemically pure magnesium sulphate is given intravenously every four hours for six doses, after which the oral administration can usually be used. It has been proven both experimentally and clinically that the magnesium sulphate will increase the tonicity of the blood to such an extent as to cause fluid from the various cavities (particularly the cranial cavity) to be withdrawn, as it were, in order to restore the blood to an isotonic state. In this way the late development of increased intracranial pressure in this particular type of case is prevented and the patients go on to uneventful recovery in almost every instance.

Class F.—So-called "concussion". The term concussion has been very loosely used and should be reserved for those cases which may be rendered temporarily unconscious as the result of a blow on the head, but in which repeated and thorough examinations fail to reveal any evidence of actual brain injury. An observation of three days will usually permit one to determine definitely whether there has been actual injury to the brain.

Class G.—Simple depressed fracture with no symptoms whatsoever and no evidence of underlying brain contusion. We feel that it is safer to elevate such fractures and inspect the underlying brain for contusion, which if found will place the patient in Class C.

Class H.—Scalp lacerations with no evidence of fracture or brain injury. Such cases should be thoroughly treated according to the principles of debridement, the underlying skull inspected, and the wound carefully sutured.

The proof of the pie is in the eating. In some three hundred cases of actual brain injury handled by my associates, Drs. Weaver and Cochran, and myself during the past four years, the mortality has been between eighteen and nineteen per cent. With a very few exceptions the patients who died had sustained massive injuries and no rational treatment could be applied. In the whole series there were only some sixty-five operations. The majority of the cases fall into Class E and of these there was only one death, this being caused by an edema of the lungs six days after injury. We feel that this comparatively low mortality is due to our attempt to place each case in the proper class, and to the application of the type of treatment which experience has taught us best suits the individual patient.

Epilepsy.—All epileptics deserve a periodic neurological survey, particularly those who developed epileptic attacks in adult life. In the review of any large series of cases of brain tumor one will be surprised to learn that in a great many such cases the only symptoms for months or years were generalized convulsions simulating

closely the attacks observed in genuine so-called idiopathic or essential epilepsy. I have recently operated upon three cases of gliomatous cyst of the frontal lobe in which there was a history of epileptiform attacks dating back fifteen, nine and three years, respectively.

Of even greater interest and deserving if possible even more serious consideration are the cases of focalized or jacksonian epilepsy. Such cases have unquestionably some lesion—macroscopic or microscopic in size, involving some particular area of the brain. We have recently had occasion to review the records of eighty cases of jacksonian epilepsy occurring in my own practice during the past six years. We have found the etiology in these eighty cases to be as follows:

1. Brain tumor	20 cases
2. Hemiplegia in children, due to hemorrhage in the internal capsule	12 cases
3. Syphilis of the nervous system	11 cases
4. Post-traumatic (adults)	10 cases
5. Birth injury (children)	4 cases
6. Traumatic cyst of brain	4 cases
7. Post-encephalitic	6 cases
8. Acute cortical encephalitis	1 case
9. Cerebral arteriosclerosis	2 cases
10. Undetermined	10 cases

From the record, the principal causes of jacksonian epilepsy in the order of their frequency would be: brain tumor, brain injury, spontaneous internal capsular hemorrhage in children, syphilis, encephalitis, and cerebral arteriosclerosis. One should, therefore, keep these possibilities in mind whenever there presents itself a case of epilepsy with focalized manifestations. With the exception of those cases caused by internal capsular hemorrhage, syphilis, and cerebral arteriosclerosis, exploratory craniotomy over the site of the suspected lesion should always be done. In this way only can many removable lesions be verified and treated. Should exploration fail to reveal a gross lesion, the cortex may be stimulated with a mild faradic current in the search of the so-called epileptic zone. Usually one can demonstrate such a zone, the stimulation of which will throw the patient into a violent epileptic seizure. This zone is considered the particularly irritable area in which the attacks start, and can then be treated with excision (Horsey) or by the injection of alcohol (Dowman)—the purpose being thereby to destroy the localized sensitive area. It is interesting to note that the localized paralysis produced by excision or alcohol injection are of only temporary duration, the surrounding centers gradually assuming the function of the area thus destroyed. Although patients thus treated are not all entirely relieved of attacks, there has been sufficiently gratifying improvement to warrant the continued use of this method of treatment.

Spinal Injuries.—Fracture-dislocation of the vertebrae frequently causes such grave injury to the spinal cord as to preclude any improvement in the distressing paralysis, regardless of the type of treatment employed. In the past it has been generally agreed that laminectomy does no good in cases giving evidence of a complete physiological lesion of the cord, whereas cases of partial paralysis were subjected to operation. Since the recent contribution of Coleman of Richmond the decision as to operative interference depends upon other factors.

Unless there is actual spinal cord compression, laminectomy combined with a free opening of the dura is not indicated, regardless of the evidence of complete or partial cord lesion. The object of laminectomy is to relieve pressure. After the usual neurological examination a lumbar puncture is done and the pressure recorded by means of a simple glass tube manometer; bilateral jugular compression is then made; if no spinal obstruction exists there will occur an immediate rise in spinal fluid pressure with a prompt fall to the original level on release of the jugular compression. If on the other hand a complete obstruction is present jugular compression will not cause a rise in the spinal fluid pressure below the level of the lesion. If the obstruction is partial the rise in pressure will be gradual and the fall when compression is released will be slow and step-like—the fluid level being higher than that originally observed. When the evidence is in favor of partial or complete obstruction of the spinal canal an immediate laminectomy should be done. If no obstruction is present the test should be repeated at least once every twenty-four hours for several days as there may develop an obstruction several days after the accident. Eventual recovery in such cases naturally depends upon the degree of actual destruction of the spinal cord.

The care of the bladder in patients of this type is a problem of much difficulty. Repeated catheterization leads eventually to an ascending pye-

litis and death. Allowing the bladder to overflow in the hope of the return of automatic vesical contractions is unsatisfactory. Our own difficulties in the matter have been solved by the institution of suprapubic drainage by means of a mushroom (Pezzer) catheter. The technic of this procedure has been so developed by Dr. M. L. Boyd of Atlanta, as to permit a continuous or intermittent drainage of the bladder with no soiling whatsoever. The infection is thereby controlled, the patient is comfortable, and should normal function return the tube can be easily removed with prompt healing of the fistula. I strongly advise all of you to adopt this valuable measure in all cases of urinary obstruction or paralysis.

Spinal Cord Tumors.—No more brilliant results are to be had in the whole field of surgery than those obtained in many cases of spinal cord tumor. The extra-medullary tumors are those most frequently found and can usually be completely removed. After removal the various paralyses usually disappear and the patients are able to resume their normal existence.

The matter of diagnosis is all important. The gradual appearance of progressive motor and sensory paralysis, preceded frequently by pain along the distribution of the posterior roots at the site of the lesion is the most significant history. Valuable aids in arriving at a correct diagnosis are the presence of a xanthochromic spinal fluid, the evidence of partial or complete spinal canal obstruction either with the method of jugular compression, or by comparative pressure readings on simultaneous cistern and lumbar punctures supplemented by the determination of the globulin content of the fluid obtained above and below the suspected lesions. The localization of the lesion depends largely upon the distribution of root pains (if such have been present), the upper level of sensory disturbance, and when an obstruction has been demonstrated, the injection into the spinal canal of lipoidol. This liquid is a combination of iodin in oil, and when injected will gravitate to the level of the obstruction. X-ray studies will reveal a shadow of the solution, thereby furnishing valuable information regarding the exact location of the tumor.

Posterior Root Section and Cordotomy.—The neurological surgeon is occasionally called upon for some measure which may relieve patients of intractable pain which resists all other efforts. Among such conditions may be mentioned painful recurrent amputation neurofibromata, intractable post herpes zoster pains, the painful visceral crises of tabes dorsalis, pains which result from the involvement of nerve roots by malignant growths, etc. Where the lower extremities are involved the operation of cordotomy as recommended by Spiller and Frazier is productive of absolute relief from pain. The operation consists of a high thoracic laminectomy and the cutting (with especially devised instruments) of the anterolateral tracks in the spinal cord. These tracks convey the pain and temperature sense fibers from the contralateral side. A division of these tracks, therefore, will stop all painful sensations from the area below the section without interfering with the sense of touch or the motor power. When the pain is located in certain limited areas supplied by one to three posterior sensory roots, an intrameningeal division of these roots is usually attended by highly satisfactory results.

Tic Douloureux.—The pain of true trifacial neuralgia is a characteristic one. It occurs in paroxysmal attacks of agonizing pain, often with intervals of relief for many months, localized in those areas supplied by one, two or all three branches of the trigeminal nerve. Alcohol injection or avulsion of the affected branches will give temporary relief for nine to fifteen months as a rule. The second application of such treatment is followed by a shorter period of relief, until eventually the only logical method of treatment is the so-called radical operation. This consists of the division or avulsion of the sensory root of the gasserian ganglion. This operation, in the hands of those thoroughly trained in such a delicate procedure, results in a complete and permanent relief of the symptoms, and is attended by practically no mortality.

It is rather unfortunate that a clear conception of the splendid results possible in such a distressing clinical entity is not more prevalent. When one remembers that in true trifacial neuralgia the pain does not spread beyond the distribution of the fifth cranial nerve, many mistakes in diagnosis will be avoided and the proper treatment in typical cases will be applied earlier. A careful differentiation should be made between typical tic douloureux and certain atypical neuralgias in which there seems to be an associated disturbance of the sympathetic system. The pain in these atypical cases spreads over areas

not supplied by the fifth nerve, and no surgery on the fifth nerve will give relief. The so-called "lower-half headache" described by Sludder is an illustration of atypical facial neuralgia. Alcohol injection of the sphenopalatine ganglion seems to give relief in some of these cases.

The character of pain in glossopharyngeal neuralgia is similar to that observed in trifacial neuralgia except in distribution. The pain in such a condition is principally in the pharynx, in the region of the faucal pillars, and is often referred to the ear. Compared to tic douloureux it is uncommon. An intrameningeal section of the glossopharyngeal nerve seems to give permanent relief.

Peripheral Nerves.—Prolonged waiting in the hope that traumatized nerves will resume their function should be discouraged. It is far better to explore an intact nerve than to overlook for many months one which has been severed. During the period of paralysis much damage is going on in the paralyzed muscles. When nerve sutures are done late, therefore, the results will probably be poor; not that regeneration in the nerve does not take place, but rather that the muscles themselves have undergone fibrosis and fatty degeneration, and few viable contractile elements remain to receive the stimulation through the regenerated neurons. The earlier nerve sutures are done, the better the results. Should it seem advisable to wait, three months should be the maximum. In the meantime, daily manual massage and the support of the paralyzed muscles should be given. Even after the nerve suture has been accomplished similar measures should be practiced. In other words, the paralyzed muscles should be kept in such condition as to prevent as far as possible a permanent degeneration of the contractile elements. When properly handled, nerve sutures are usually attended by excellent results. The method of suture is all-important. Stay sutures through the nerve itself should be avoided, and the approximation should be brought about and maintained by means of fine silk sutures in the nerve sheath. Complete hemostasis should be assured, as a small hematoma between the approximated nerve ends will promote fibrosis, which in turn will interfere with the regenerating neurons in their descent into the distal portion of the divided nerve.

There are many other phases of neurological surgery which can not be discussed at this time, as already, I fear, your patience has been overtaxed. The method of handling the hydrocephalic child, spina bifida, abscess of the brain, spasticity of childhood, Raynaud's Disease, spasmodic tortocollis, injuries of the brachial plexus, etc., present many interesting problems. It has naturally been out of the question to do more than skim the surface, as it were, in order to leave the impression that the problems of neurological surgery are those of everyday practical interest. Much has already been accomplished and if I dared utter a prophetic note I would predict that the future will see the solution of many problems of the nervous system which at the present time wear a sphinx-like countenance.

CHOLECYSTOGRAPHY*

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The discovery in 1919 by Abel and Rowntree that phthaleins and their derivatives when injected subcutaneously were excreted only in the bile opened the way to visualization of the gall-bladder.

In 1923-1924 H. A. Abramson, experimenting with dogs, injected neo-silvol in amounts of 1 c.c. of a 35% solution directly into the gall-bladder. Excellent photographs were obtained. He found that the presence of pneumoperitoneum, whether operatively or artifically produced, aided in the visualization.

Early in 1924 Everts A. Graham, M.D., and Warren H. Cole, M.D., of St. Louis, Mo., undertook to prove that the gall-bladder could be visualized by the X-ray providing the following requirements were met:

"(1) It must be a substance which could be introduced by injection subcutaneously or intravenously or could be given by mouth.

(2) This substance must be something which would be excreted almost entirely by the bile, and, further, into the gall-bladder.

(3) It must be a substance which would not be toxic in the proportion necessary to produce a shadow."

The extensive use of various dyes in the search for a suitable test of the liver function revealed the fact that some are excreted almost entirely into the bile, viz: tetrachlorphenolphthalein and rose bengal. From this fact a similarity of chemical structure lead to the use of tetraiodophenolphthalein and tetrabromphenolphthalein.

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Satisfactory shadows were obtained in both instances.

As much as *eight* atoms of the iodine was substituted for the *four* atoms of chlorine, but unfortunately the octoiodophenolphthalein proved too toxic for use; the octobromphenolphthalein also proved too toxic.

In the early experiments very poor shadows were obtained in some cases and a change to the calcium salt was made. It was later found that the fault lay, not in the salt, but in the fact that these particular cases had food in their stomachs or duodenums. With this explanation the difficultly soluble calcium salt was promptly discarded. In the use of the sodium tetrabromphenolphthalein the dose, approximately 5 gm., is dissolved in 40 c.c. of distilled water. This solution is then given in 20 c.c. amounts at half hour intervals necessitating the puncturing of the vein twice. It also requires that a teaspoonful of sodium bicarb. be given every three or four hours following the injection. The need for this is based on the theoretical ground that the presence of the bicarb. in considerable quantities in the stomach tends to close the sphincter of Oddi and so prevent the emptying of the gall-bladder. Using the sodium tetraiodophenolphthalein the dose, approximately 3.5 gms., is dissolved in 100 c.c. normal saline solution. To this is added 1.5 to 2.0 c.c. of 10% solution of sodium carbonate to keep the salt in solution. This solution is autoclaved for thirty minutes at 15 lbs. pressure. At the time of injection normal saline is added to make a 1 or 2 per cent solution which is given slowly at one injection.

The best shadows are obtained in normal individuals.

As early as February, 1925, Graham & Cole stated it was possible that the toxicity of the iodine compound might in part be due to decomposition products. We feel, according to our experience, that this probability has been eliminated. Several companies are now marketing a tetraiodide compound which seems free from impurities and which, they claim, does not decompose. This statement as to decomposition is not borne out in our series.

Sodium tetraiodophenolphthalein has a molecular weight of 682. It is a light blue, crystalline compound which is soluble in water to the extent of at least 40 per cent. The lethal dose in dogs is 0.29 gms. per kilogram of body weight—the same as that for the bromine salt.

Sherwood Moore states that sodium tetrabromphenolphthalein has, in his hands, been successfully given only by the intravenous method, though it has been administered by mouth; also by rectum. By mouth, either through vomiting or diarrhœa, failure has been the result. Early expulsion of the injection lead to failure by the rectal route. The iodine compound is now being successfully used by the oral method.

Before the development of cholecystography roentgenographic examination of the gall-bladder consisted in the demonstration of some cases of stones, poor visualization of a thickened gall-bladder and a few unreliable secondary signs of cholecystic disease. These signs were difficult to elicit and allowed of much uncertainty and difference of opinion.

Moore believes that almost every patient with symptoms of gall-bladder disease should have a gastro-intestinal study with the opaque meal in addition to the investigation of the bile tract with the dye.

Graham, Cole and Copher say that in order to visualize the gall-bladder it is necessary (1) that the liver excrete the dye; (2) that the hepatic, cystic and common ducts be patent; (3) that the gall-bladder have the ability of emptying and filling itself; (4) that the latter, once filled, be of a size to contain a sufficient amount of dye to give a shadow; and (5) that the gall-bladder be able to concentrate the dye.

What cholecystography may reveal in the case of recent or acute disease and in young subjects with vague symptoms, there is, as yet, little data to go on.

Quoting from Graham, Cole and Copher: "In conclusion, I would like to point out that under most favorable circumstances and with meticulous care the usual roentgenographic methods of examination of the biliary tract have been but 47.4 per cent correct over an eight-year period when checked by operation. In our series, so far, cholecystography has been 92.5 per cent efficient.

Doctor W. H. Stewart, New York City, in the use of the bromine compound, notes considerable reaction in many of the cases, some quite severe. The first sign was a flushing of the face followed by headache, nausea, vomiting and faintness. Doctor Stewart says: "The severe symptoms last but a few minutes. Some had a persistent headache and dizziness for twenty-four hours." Recognizing this reaction as the

most serious objection to the method, special attention has been given to its prevention. Improvement has been aided by a more careful selection of the patient. Among those enumerated as poor subjects he mentions "highly emotional and neurotic patients." Our experience emphasizes this statement.

In our series, using the iodine salt only, the first symptom of reaction was invariably "nausea"; immediately followed by increased pulse rate; pallor of the skin and complaint of faintness. Ten to fifteen minims of adrenalin chloride hypodermically relieved the symptoms in one to three minutes.

Russel D. Carman, M.D., of the Mayo Clinic, believes that in the use of the bromine compound reactions are so severe as to be contraindicated in certain conditions. These conditions include—(1) obstruction of the common duct; (2) extensive hepatic disease; (3) marked diabetes; (4) hyperthyroidism; (5) arterio-sclerosis; (6) hypertension and cardiac disease, especially that attended with auricular fibrillation. So far as we can learn this is the first note of warning as to definite clinical contraindications for the test.

Doctors Lester R. Whitaker, Gibbs Milliken and Edward C. Vogt of Boston were the pioneers in the oral administration of a dye in cholecystography. These gentlemen used the iodine compound in place of the bromine. I quote as follows:

"It was found that with the double salol-coated pills a large proportion of them went through the alimentary canal without being dissolved. Even with single coated pills some of them passed through. In spite of this fact, definite gall-bladder shadows were produced in 92 per cent of the normal subjects and 85 per cent of the patients. On the whole, the shadows produced by the oral method were less dense than those by the intravenous method with the iodine salt." These men are now using a pill coated by steric acid. Since the above statement, this method has greatly improved until it has almost excluded the intravenous method in routine examinations.

With our present knowledge of the oral method for cholecystography, we would suggest that patients suspected of having gall-bladder disease *first* be given the drug by mouth. If a normal, clearly outlined shadow which diminishes rapidly in size during digestion is obtained, the probability of gall-bladder disease is slight. If, on the other hand, the shadow is imperfect or absent, providing the technic has been good, then an intravenous injection of the drug should be made in order to confirm the findings. The one serious objection to this is the matter of added cost.

Whitaker, Milliken and Vogt claim 95 per cent correct diagnosis in their proved cases.

It is now conceded that the iodine salt is a safe drug to use; also that it yields better results than the bromine salt.

Sabatini is experimenting with the alkaline bromides, 20 gm. of bromide of soda and strontium combined dissolved in 100 to 150 c.c. of water, in cholecystography.

He writes: "The remarkable results obtained by this method have been very encouraging; the clearness of the radiograms showing the visible gall-bladder, the advantage of being simple in use and the fact that it does not disturb the patient, suggests the possibility that the bromides will replace other means recently suggested for the same purpose."

The above, at first, sounds most encouraging, but the necessary preparation is very trying and for practical use almost prohibitive. Briefly, two days before the examination the patient is given a light purgative. The next morning he takes bouillon and an egg; at 2 P. M. he takes 1 to 1½ ounces of castor oil; at 5 P. M., a cup of milk. After no nourishment, *not even water*, at 9 P. M., an enema of tepid saline solution. Between 2 and 4 A. M., the bromide solution is given. No food or water is allowed during the time of examination. Radiograms are made five, eight and twelve hours after taking solution.

It has been shown that oil introduced into the duodenum produces a sudden marked change in the size of the gall-bladder shadow. Pituitrin seemed to cause a contraction of the gall-bladder wall, and atropine a relaxation. Boyden has noted particularly the effect of lipoids and fats upon the emptying of the gall-bladder. Sosman, Whitaker and Edson have worked extensively on the effects of various stimuli, including foods and chemicals, on the shadows of gall-bladders. They obtained the most marked diminution of the size and density of the gall-bladder shadow after the ingestion of fats. There was no response to psychic stimuli, carbohydrates, pilocarpin, adrenalin, hydrochloric acid, bile salts, or nitroglycerine. A moderate response was obtained from proteins and magnesium sulphate. Slight paralyzing effects were obtained from atropine and alcohol.

Cholecystography has brought out the interesting fact that the gall-bladder does *not* lie in the gall-bladder region as is set forth by clinicians, or as described in the anatomy.

Doctor Sidney Lange states that in his series of 500 cases the gall-bladder extended either partly or wholly below the lower limits of the hypochondriac and epigastric regions in 75 per cent of the cases. Usually it descends into the umbilical region, but quite frequently into the right lumbar region.

Furthermore, in the 25 per cent of the cases in which the gall-bladder is found above the second lumbar vertebra, that is, in the so-called gall-bladder region, it does not always lie in the line that separates the hypochondrium and epigastrium, but may lie far to the right of this line and may be found outward as far as the axillary margin of the abdomen.

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INTERPRETATION OF CHOLECYSTOGRAMS*

W. McL. Shaw, M.D.,
Jacksonville.

All authorities are agreed that cholecystography is still too recent to justify any dogmatic statement regarding the interpretation of the X-ray shadows.

It is an established fact that elements are opaque to X-rays approximately in proportion to their atomic weights. The atomic weight of bromine is 80, while that of iodine is 127. Sodium tetrabromphenolphthalein contains 47 per cent of bromine; while sodium tetraiodophenolphthalein contains 59 per cent of iodine.

Theoretically, it should require about 50 per cent as much of the iodine as of the bromine salt to produce the same density of shadow in a radiograph. In actual experiment, in order to produce shadows of equal density, it was necessary to have a depth of solution of the iodine salt of 3.8 centimeters, while that of the bromine salt was 5.5 centimeters.

Graham and Cole of St. Louis state that a *normal* gall-bladder will begin to cast a shadow three and a half to five hours after the intravenous injection of the dye; that the shadow will show a tendency to change in size; that its heaviest shadow will be cast between sixteen and twenty-four hours, and it will empty in about forty-eight hours. In our series, we have obtained definite shadows of the gall-bladder as early as one hour following injection in several normal cases. The shadow shown on the four or eight-hour films is almost invariably larger than the subsequent shadows. So far, all gall-bladders that failed to show "elasticity or dis-

*Read before the 53rd Annual Meeting of the Florida Medical Association, Gainesville, Fla., May, 1926.

tensibility" at some time during the series, the injection being satisfactory, have been proved pathologic by operation, or have given definite clinical findings of gall-bladder disease.

The density of the gall-bladder shadow is dependent on its concentration power. This may be partially or completely destroyed by disease. A failure to cast a shadow is practically 100 per cent proof of disease of the bile passage.

Whitaker of Boston states that food rich in fats produces a marked shrinkage in the size of the gall-bladder shadow. In demonstrating this the Boyden meal is used, viz, the yolks of four eggs and one-fourth to one-half pint of cream. We have obtained good contractions one hour following a cup of cocoa with buttered toast, or a salad rich in salad dressing. It has been reported that the gall-bladder responds markedly to psychic influences and is often emptied by the smell of appetizing odors of foods, especially broiled or fried meats. The enormous reduction in size of the gall-bladder one hour and a half after such a meal indicates that most of the bile has been thrown out through the cystic duct. In a number of cases there was a much more marked reduction in size of the shadow after the taking of food rich in fat than after the intraduodenal injection of magnesium sulphate, as practiced by Doctors Silverman and Menville of New Orleans. This finding, Dr. Whitaker says, reflects a good deal of doubt upon the value of non-surgical biliary drainage by magnesium sulphate. Why subject the patient to the discomfort of a duodenal tube if you can drain the gall-bladder better by giving him bacon and eggs in the morning?

As regards the interpretation of *abnormal* shadows, we feel that there is still much to be discovered. We do feel, however, that we have certain criteria for the establishment of the *normal*. One requisite necessary to normalcy is that the shadow should appear fairly early, i.e., there should be a good shadow by the end of the fourth or fifth hour with the intravenous method and by the twelfth hour by the oral method; again the edge of the gall-bladder shadow should be regular and of fairly normal contour; further, the gall-bladder should show a strong capacity for emptying itself.

As to gall-stones, the evidence usually presents itself in either of two ways. Some stones become denser by the dye coating, while others, which are usually classed as negative stone shadows, show within the gall-bladder shadow as a mottling by a displacement of the dye.

Some cases indicate that the observations of the late Dr. Walter Mills of St. Louis concerning the relationship of bodily habitus to the form, function and tonus of the alimentary canal, applies with equal force to the gall-bladder. Following this out, each type of habitus should have a characteristic gall-bladder. For example, the asthenic should show a long, laterally narrow organ in a low position in the abdomen, whereas the sthenic individual should show a shorter, wider, in fact, circular shadow close up under the costal margin. Intermediate types will show characteristics in between these extremes.

Graham, Cole and Copher, of St. Louis, say: "I believe we are too greatly influenced in our efforts at interpretation by the findings in other organs. We expected to find deformity of outline, filling defects, localized variation of shadow intensity, intensification of gall-stone shadows present or suspected, impression of adhesions, etc.; in point of fact, few or only suggestive evidence of any of these have occurred in our material. Even a cursory examination of gall-bladders excised supplies the reason why this is so. They are so extensively diseased that but little of the injected dye could reach the organ. Its concentration in such an organ would be impossible. As to distortion of outline by adhesions, it may be laid down as almost *axiomatic* that adhesions about a hollow viscus produce such results only in the *rarest* of instances. Adhesions *fix an organ*, occasionally they displace but only *exceptionally* do they deform it. If the gall-bladder possesses peristalsis, adhesions will affect this function, as in other hollow organs, by interference with its conductivity."

It is generally agreed that: (a) if no shadow is obtained in the series, a pathological condition is present in the biliary tract; (b) if the shadow is present, but faint, the hepatic, cystic, and common ducts are patent and the gall-bladder is diseased; (c) if the shadow is present, either faint or intensive, but of uniform size throughout the series, there is present disease of the organ affecting the wall. Persistence of the shadow beyond forty-eight hours has not been encountered enough to justify conclusions.

Gall-bladders giving no shadow and apparently normal at operation have been found, on incision, not only to be diseased but to contain stones.

Whitaker and Milliken of Boston state as follows:

"The conditions indicating pathological gall-bladders have been (1) failure to produce a shadow due to cystic duct obstruction or severe cholecystitis; (2) gall-stones which are not seen in the plain films but show 'negative' shadows in the cholecystograms; (3) failure of the normal expansion and contraction of the gall-bladder; (4) distortion of the shadow due to causes in or about the gall-bladder."

CHOLECYSTOGRAPHY*

L. W. CUNNINGHAM, M.D.,
Jacksonville.

Analysis of the patients studied at our office and in the hospitals by Dr. Shaw and myself, covering all referred cases, shows that we have given the dye (sodium tetraiodophenolphthalein), one hundred and thirty-four (134) times. By the intravenous method thirty-five (35) times; by the oral method, ninety-nine (99) times. Gall-bladder shadows secured by the intravenous method are uniformly good, excluding those patients with deficient liver and kidney function. No shadow, or poor shadows were secured in sixteen (16) cases. This has, at times, diagnostic significance. Again, is due to poor solution and absorption of the dye, and when the patient is studied with the intravenous method, a clean-cut gall-bladder shadow is, as a rule, secured. In three children we essentially secured no shadow (all oral studies). Two patients were given the drug twice orally. Eight patients were given the drug both orally and into the vein. Forty-eight (48) studies were reported as normal. Fifty-six (56) as chronic gall-bladder disease. Ten (10) chronic gall-bladder disease, with stones. Thirty-one (31) patients were operated, and of these twenty-nine (29) showed a confirmation of diagnosis of chronic gall-bladder disease, with and without stones. Operative reports made by the operating surgeon: Two cases, reported as normal, were found at operation to be completely enveloped and sealed over with adhesions, or congenital bands. Subsequent study of the barium meal examination indicates in these evidence suggesting fixation of the duodenal cap. Poor shadows were secured in three cases with the intravenous method, probably due to deficient liver function. Poor, or faint shadows, were secured by the oral method in seventeen (17) examinations (about 15%), due to nausea, vomiting, purging, poor solution and absorption of the dye in the intestine. Again, possibly due to diagnostic poor filling. Our results with the dye study are exceedingly encouraging. We feel that the so-called "indirect" signs are of distinct value. Fine crenation of the duodenal cap has, in our experience with a few exceptions, been a finding in chronic gall-bladder disease. Marked obstruction of the second portion of the duodenum has indicated chronic gall-bladder disease without stones in three cases seen. Retention and projection of barium in the ampulla of Vater has uniformly been associated with chronic gall-bladder disease. Real, actual pressure deformity of the pyloric bulb and duodenal cap has indicated chronic gall-bladder disease.

*Read before the 53rd Annual Meeting of the Florida Medical Association, Gainesville, Fla., May, 1926.

DISCUSSION

Dr. John S. Helms, Tampa:

I wish to express my appreciation for the great historical, scientific and practical value of this presentation. It illustrates, too, the great value of splendid team-work. I have oftentimes cited a quotation, that is, a quotation from others, that the day has come when the practice of medicine cannot be carried out successfully by one individual. The study of the gall-bladder is a splendid illustration of the field wherein it requires team-work, one that should have consulting specialists in the different branches and different phases of the work.

When we are considering gall-bladder disease we must not overlook the fact that we are not studying the gall-bladder alone. The gall-bladder, when it becomes diseased, is not diseased within itself alone. There is associated with all cases of cholecystitis, hepatitis, and oftentimes pancreatitis. We must not overlook these associate organs in the study of gall-bladder disease.

The later methods of the study of gall-bladder disease have given us more or less positive findings with respect to end results of gall-bladder disease—that is to say, gall-bladders that have stones, and gall-bladders that may be closed by fibrous or other pathological conditions. Now, the point the physician is interested in is upon what finally rests the relief of these patients who are suffering from gall-bladder disease—he wants to know some method whereby he will be able to make a diagnosis in the early stages of the disease when he can give the patient

definite and permanent relief. The surgeon usually sees only the end results of gall-bladder disease, and at that time, the hope for complete recovery of the patient, due to the fact that he has a chronic hepatitis, and probably a chronic pancreatitis, is not so favorable. To add to that, he has an extraordinary operable risk to contend with, whereas, if the diagnosis could be made in the early stages of the disease that operative risk would be very small, indeed, and an ultimate complete recovery of the patient would be assured.

Now, I regard this dye method of cholecystography a very great advance in the study and diagnosis of gall-bladder disease. Graham states that the test is largely a functional test—that is to say, a test of the function and power of the gall-bladder to concentrate bile, and also test the function of the gall-bladder to equalize and maintain a proper pressure with the bile system. Also, it gives some idea of the function of the liver. This is of great value, and if the Internist, Physiologist and Roentgenologist could get together and decide upon some definite standard as to what the gall-bladder function really is, then the test will be of much more value. I think the test bears the same relation, at this time, to the diagnosis of gall-bladder disease as to the opaque meal test bore to the study of the stomach and gastrointestinal tract in the early stages, and that the final outcome of the method will be, perhaps, as perfect, or more perfect than the study of the gastrointestinal tract by the opaque meal method of today.

I think the matter presents a more hopeful aspect. And, I think, that we will have in this an added method of diagnosis that will finally enable us to diagnose gall-bladder disease in its incipiency, when the pathology has not grown to that point where final and permanent relief cannot be had, and without a great deal of risk.

Dr. G. Raap, Miami:

We must bear in mind the fact that this method of studying the gall-bladder is still in its infancy. I believe those of you who were present at the last State Meeting will recall that Dr. Beals showed us some radiographs which clearly demonstrated that the gall-bladder could be visualized by this method. You may have noticed from Dr. Cunningham's paper that we are not studying the types of shadows that we know—and that is the only severe block in the progress of this method of examination. We are all enthusiastic about it; we are bound to be, because it is the only method of any great merit that we have in the study of gall-bladder disease. We have to go through the same progress that we went through in the study of the gastro-intestinal tract by use of the barium meal. In the use of the barium meal we are dealing largely with a mechanical sort of thing, but in the use of the dye we have other factors that have to be borne in mind except mere mechanics. Barium is an inert sort of thing, while the dye, or the process by which it is brought into the gall-bladder, is much more complicated than the process by which the barium passes through the gastro-intestinal tract. There are so many factors which have a bearing upon the degree to which the gall-bladder will be demonstrated in the radiograph. The statement was made that practically in 100 per cent of the cases which did not show shadows we may state that there is a pathological condition. I believe that in time we are going to have to change that statement. I don't believe that it is going to hold to the extent of 100 per cent. I have noted a few cases with ulcerations, either of the duodenum or of the stomach, that did not necessarily produce marked adhesions in the area adjacent to the gall-bladder, yet serving as irritating factors, which changed to a considerable extent the degree of radiability of the gall-bladder which had been filled with dye.

One thing I was glad to hear Dr. Cunningham bring out, and that was the point that the dye method justifies many of the deductions that we made before we had that method. We still have to depend to a very great extent upon indirect findings, and it is only in the light of the new method that we have been able to ascertain, for instance, the reliability of such evidence as a fine feathering of the duodenal cap or duodenum as having a definite relation to gall-bladder disease.

I believe that ultimately there is going to be added to the method of dye ingestion or dye injection, some mechanical measure by which we may be able to give a type of dye in which there will be secretion which can be measured, so that if all of it is not secreted into the gall-bladder, we may ascertain where it is going, and why. Of course, that is all going to be advance work along this line.

The statement was also made that providing the technique is perfect we ought to have a visu-

alization in the normal gall-bladder, but in the organic or pathological gall-bladder we may not get a visualization. The burden of proof as to technique rests with the Roentgenologist. But, on the other hand, there has to be a close cooperation between the surgeon, the Roentgenologist and the Internist.

Dr. Helms brought out the point that we hoped by this method to be able to study the early stages of the pathology, and I believe that is going to be one of the real values of this method. We have seen one or two cases in which the diagnosis of pathological gall-bladder was made, but the surgeon hesitated very much before removing the gall-bladder even after he had opened up the abdomen—in contrast to the older surgeon who palpated the gall-bladder and said that it would have to come out. But there have been a few of these cases in which microscopic section showed sufficient pathology to warrant surgical removal. We noticed in a case which was sent to Mayo some time ago, that they would not remove the gall-bladder because they did not feel, from inspection and palpation, that it was pathological, but in some of their recent literature they have stated that they are more and more inclined to remove the gall-bladder, provided the findings by this new method are positive.

As to the amount of dye which will outline a gall-bladder: I had the opportunity of getting two specimens and tried them out, using distilled water as a medium to place the dye in, then injecting the dye into the gall-bladder, which had been removed and tied off at the neck, and I found that it requires a percentage of dye not over 3 per cent to give you a shadow through an equivalent which corresponds to the thickness of the patient, and I have noted in some of them that 2½ per cent of the dye will show up the gall-bladder. So it goes to prove that we really don't have to get much of the dye into the gall-bladder to produce a shadow, and we may from that infer that if we cannot get even 2 per cent of the dye into the gall-bladder, there must be a sufficient pathology to warrant such a diagnosis.

Dr. J. C. Dickinson, Tampa:

I would like to ask one question—if I correctly understood Dr. Boyd to say that this dye had been used in some two or three children, and in each of these cases the gall-bladder was not visualized. Was I correct, and if so I would like to ask if these children gave evidence of pathology and if so, that Dr. Boyd or Dr. Cunningham give some explanation as to why uniformly negative results were obtained in this number of children. If they can enlarge upon that in closing, I think it would be helpful.

Dr. J. A. Beals, Jacksonville:

One thing that has impressed me very much in the development of the study of gall-bladder examination by the dye method is this: that the surgeons themselves are not well agreed as to what constitutes a pathological gall-bladder. Therefore, the evaluation of this dye method is in very much the same position as the evaluation of the older methods, and some years ago the evaluation of the gastro-intestinal methods. The surgeons are not always agreed. I would, therefore, like to call your attention to a summary from Dr. Graham, the author, in a way, of this dye method, in which he sets forth in Radiology for April, 1926, and gives the criterion upon which he judges a pathological gall-bladder. I realize clearly all of the surgeons might not agree with him as to all of his criteria, but would it not be very well, indeed, in judging this method, if the surgical criteria for the normal and abnormal were set down side by side with the findings by the dye method?

Dr. J. S. McEwan, Orlando:

Fellows, that was a very fine paper that Dr. Cunningham and his collaborators read to us this morning, and it is one of the greatest advances in radiography that we have had in some time, and one of the greatest helps to the surgeon in the diagnosis of gall-bladder trouble. We must not lose sight of the fact that we still have our clinical symptoms first, and then we have our radiography, second. If we base our diagnosis on our pictures alone we will go astray most of the time. The pictures must correspond and should correspond with our clinical symptoms, which should come first.

CONCLUSION

Dr. L. W. Cunningham, Jacksonville:

We might say that in two of these children they had definite evidence of disease in the biliary tract, but we did not feel the urge to punish them any more by trying to give them more dye. One child did not have any evidence of disease of the biliary tract, but a suggestive history. Our

cases of children are limited, and we do not know why we do not secure shadows of the gall-bladder.

The pathological study of the gall-bladder, when removed, is the last word as to gall-bladder disease, or its absence. One of the cases that we saw Dr. Boyd remove the gall-bladder recently—and he was in doubt as to whether it was in trouble, but finally thought it was and took it out—was reported by the Pathologist as a chronic gall-bladder.

Our paper, of course, deals entirely with the question of dye study of the gall-bladder and not of the diagnosis itself or of the patient. We, of course, realize that cholecystography, or other X-ray evidence, must be taken and weighed carefully with all other evidence that you can collect, and that the X-ray does not make a self-supporting diagnosis in this line of work or in any other line of work. It may appear to, but it is wiser to get all of the evidence.

PROSTATIC HYPERTROPHY*

E. T. Sellers, M.D.,
Jacksonville.

Hypertrophy, or enlargement of the prostate in itself, is an innocent disease, but has considerable influence upon the health and comfort of its victim. It is a disease of the declining years of life. That famous English surgeon, Sir Benj. Brodie, once said: "When the hair becomes grey and thin, when there is formed a white zone about the cornea, at the same time, ordinarily, I dare say, invariably, the prostate increases in volume." This, no doubt, is true.

The greatest majority of cases are discovered between the ages of fifty and sixty-five. Though, no doubt, the process of enlargement has been going on for a considerable period of time. However, cases have been reported in middle life, or even younger. One case of the fibrous type, occurring at the age of thirty-two, has come under our observation.

There are two types of prostatic enlargement, classified according to overgrowth of glandular substance, or fibrous tissue. The larger the prostate the greater the amount of adenomatous substance. This type may become very large. We have seen one that weighed one hundred and ninety-two grammes. Dr. Deaver states that they reach the weight of three hundred seventy grammes, or over. In view of the fact that the average normal prostate weighs about twenty-five grammes, this is considerable enlargement.

The fibrous type does not become very large. In fact, it may be no larger, or even not as large as the normal prostate, but weighs more in proportion than the adenomatous enlargement.

The effects of prostatic enlargement are due to the secondary changes that take place in the urinary tract on account of retention and infection. Retention may be caused by a ball-valve action from enlargement of the middle lobe or by the elevation of the posterior urethral opening above the bladder floor on account of the upward growth of the prostate. The posterior urethra becomes elongated, tortuous and compressed, increasing the degree of obstruction.

The bladder soon becomes a dilated reservoir which is never completely emptied, and this dilation eventually extends to the ureters and kidneys, causing hydronephrosis and renal insufficiency, which is manifested by lowered kidney output and increased non-protein blood nitrogen.

Since the bladder is never emptied, there remains an ideal culture media in the decomposed residual urine for infection to take place, the results of which are cystitis, pyelonephritis and pyonephrosis.

A great many patients with considerable prostatic enlargement are not aware of their condition. They are not inconvenienced in the least by virtue of this enlargement. The degree of enlargement has no bearing on the severity of symptoms, as some of the very large adenomatous prostates are accompanied by less severe symptoms than the small fibrous type.

Patients who are seen in the first stage of this disease usually present themselves because they are inconvenienced by nocturnal frequency of urination. This is the first symptom of prostatic enlargement, due to congestion of the vesical neck rendering the bladder more sensitive to distention. However, there are a great many old men who think it an established custom at their age to arise once or twice during the early morning hours to void and never seek professional advice for this symptom.

The second stage is that of retention without infection. A great many of these are not aware of their condition until they develop a sudden complete retention, usually brought about by undue exposure to cold or as an aftermath of a drinking spree.

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*Read before the Staff of St. Luke's Hospital, Jacksonville, December, 1925.

And, still, there is another type who is well aware of his plight. This is the pitiful old man with all the symptoms of chronic retention and infection who is in the third stage of prostatic enlargement. This is a typical picture.

This is the type of patient we wish to consider in this paper. On account of the age and characteristic symptoms; by rectal palpation with an instrument in the urethra and with the aid of the cystoscope the diagnosis is usually not difficult. However, malignancy, atony of the bladder, prostatic calculi and strictures of the urethra must be eliminated.

Cystoscopy is indicated in nearly every case of prostatic enlargement before an operation is performed. A median lobe enlargement can not be diagnosed without the aid of the cystoscope, but its greatest asset is in ascertaining the intravesical condition and its complications. Diverticula and calculi are not infrequent complications, while recognized by cystoscopy. This is most important where perineal prostatectomy is to be done. Cystoscopy, however, is not without danger in these old men with retention and infection. It should be done with the utmost gentleness and with a thorough understanding of their renal condition. There is considerable trauma with the most careful technique, and the cystoscopist should make his examination as short as possible, else an impending uremia might be precipitated. This is especially true in cases with a great amount of residual urine who have never had urethral instrumentation. Even these patients may be examined with safety at the proper time during their preoperative treatment by an experienced cystoscopist.

We use a small indirect vision cystoscope for these cases. It has a fairly large lens system, since there is no catheterizing apparatus attached. This gives good vision, and at the same time produces the least amount of trauma. It is not possible to catheterize the ureters in some of these; it is very difficult in others and unwise in most of them, as there is very little to be gained. It requires more time and produces considerable more trauma.

Of greatest importance to these old men is what relief can be expect, and in what way may this relief be brought about. Is he to use a catheter the rest of his life or submit to a surgical operation?

If he chooses the catheter life, he not only will be miserable during this time, but will likely die within a few years of renal complications. We rarely ever see one who uses the catheter practice asepsis or even gentleness. Occasionally, however, we see one who has used a catheter for many years without renal complications. It has been our experience to see many who choose a catheter life return and ask for surgical intervention.

Prostatectomy effects a cure in the greatest majority of cases, is a relief in others and a failure in a very limited number. The results in these cases of retention and infection depend largely upon the condition of the bladder and kidneys; the patient's general condition, the preoperative treatment and the selection of time during this period for operation.

The phenolsulphonephthalein output and retained blood urea and creatinine are our criteria in determining the condition of the kidneys. Since nearly all of these patients with retention and infection have low phthalein output, high blood urea, and who generally are in poor physical condition, we feel that the most important thing in preparing them for operation is the preoperative treatment. First, kidney decompression is done, using the indwelling urethral catheter or by cystotomy. Where there is a large amount of residual urine, gradual emptying of the bladder is imperative. Sudden decompression causes congestion of the kidneys, which may result in complete suppression of renal function and death of the patient.

We are of the opinion that cystotomy should be done even though a catheter is used for the gradual emptying of the bladder. This puts the posterior urethra and bladder at rest, relieving congestion and inflammation.

After decompression is done we begin our eliminative and supportive measures. Fluids are forced to a point of tolerance. Sweating is induced by hot blankets or by the administration of some of the diaphoretics by mouth. Salines are given. The heart is supported by digitalis and normal saline is given under the skin. With these measures, the blood pressure begins to recede, the phthalein output is increased and the blood urea is diminished, as Dr. McIver will develop in his discussion of this paper.

The patient's general condition improves, and though the laboratory reports of phthalein output and blood urea after a considerable period of preoperative treatment are not altogether encouraging, these patients have become tolerant of their condition and become good operative risks.

PROSTATECTOMY—TRANS-SACRAL AND CAUDAL ANESTHESIA*

A Series of 40 Consecutive Cases.

Robert B. McIver, A.B., M.D., F.A.C.S.
Jacksonville.

The type of patient seeking relief for prostatic obstruction representing, as he does, the pathologic complexities of declining decades, is responsible for the high mortality that formerly obtained when the case was handled along general surgical lines. The recognition of the necessity for preliminary preparation, the development of clinical, bio-chemical and cystoscopic studies, the refinements of surgical technique, all leading to a reduction in mortality, constitute an advance that reflects credit to the workers in this particular field. Regional anesthesia is the most recent and not the least important factor in this progress. Elimination of general anesthesia, especially in border-line cases and poor risks, relieves the heart, lungs and kidneys of added strain, and affords that margin of safety often essential and always desirable.

Forty consecutive cases have been studied with particular reference to trans-sacral and caudal anesthesia; each case has been completely examined by an internist, has had repeated blood chemical and renal functional studies by the clinical laboratory, and has been cystoscoped, injected and operated, under a uniform technique. All cases seen during the time of this investigation have been operated, although several have required weeks of rest, elimination and digitalis, under the care of the internist, before the existing complications could be improved sufficiently. The supra-pubic, two-stage, operation was employed, except in four cases, when the cautery punch was used.

Age:

Average age	68 years
Youngest	32 "
Oldest	91 "
Below 50 years	1
50 to 60 "	6
60 to 70 "	14
70 to 80 "	12
80 to 90 "	6
Above 90 years	1
Total Cases	40

Presenting Symptoms:

Frequency.
Dysuria.
Retention.

Residual Urine:

Average	240 c.c.
Lowest	60 c.c.
Highest	1,600 c.c.

Urine Output in 24 hours:

Before cystostomy—Average	1,200 c.c.
Before prostatectomy—Average	2,800 c.c.

Essential Laboratory Findings:

1. Phenolsulphonephthalein:
   - Before cystostomy—Average... 38%
     - Lowest.... 10%
     - Highest.... 60%
   - Before prostatectomy—
     - Average... 65%
     - Lowest.... 50%
     - Highest.... 80%
2. Blood Urea:
   - Before cystostomy—
     - Average... 35 mg.
   - Before prostatectomy—
     - Average... 18 mg.
3. Blood Creatinin:
   - Before cystostomy—
     - Average... 2.5 mg.
   - Before prostatectomy—
     - Average... 1.3 mg.

Additional Diagnoses after physical examination, listed in the order of the frequency:

Cardio-vascular-renal Disease.
Arterio-sclerosis.
Myocarditis with decompensation.
Bronchitis—chronic.
Bronchiectasis.
Nephritis—chronic—Hypertension.
Hernia—inguinal.
Hydrocele.
Calculus, prostatic.
Calculus, uretral.
Paralysis, spinal lues.
Appendicitis, acute.
Diverticula, bladder.
Iritis.
Epididymitis, specific.
Papilloma, bladder.

*Presented before the Annual Meeting of the Florida Medical Association, St. Petersburg, Florida, May, 1925.

Existing lesions were given appropriate preliminary treatment where possible or indicated. Cystoscopy was routine in this series. In some cases it was performed during supra-pubic cystostomy, employing the cystoscope directly through the opening in the bladder. With care

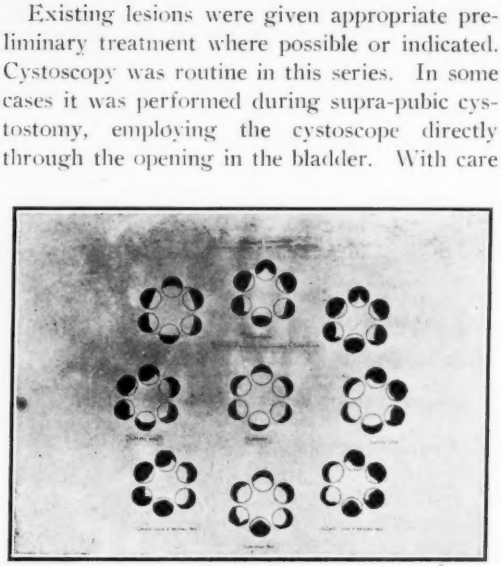

FIG. I.

CYSTOSCOPIC VIEWS, PROSTATIC HYPERTROPHY.

Center—Normal Sphincter. Upper Left—Mild General Hypertrophy. Upper Middle—Moderate General Hypertrophy. Upper Right—Massive General Hypertrophy. Middle Left—Right Lobe Hypertrophy. Middle Right—Left Lobe Hypertrophy. Lower Left—Right Lobe and Median Lobe. Lower Middle—Median Bar. Lower Right—Left Lobe and Median Lobe.

this is possible without much delay or trauma, and without allowing the urinary retention to escape rapidly. Gradual, intermittent release of urine from a distended bladder to avoid congestion of vesical veins and of the kidneys should always be strictly observed. Introduction of the cystoscope per urethra was fairly comfortable under caudal injection alone, even in cases with considerable prostatic hypertrophy, a number 20-French observation instrument being used. Cystoscopy gives exact data regarding the location and character of the obstruction (Fig. I) by changes observed in the contour of the internal sphincter, and aids materially in the selection of the type of operation to be employed. Calculi, vesical tumors and diverticulæ are discovered during this examination. Cases, that for good reason should not be subjected to cystoscopy, can be investigated by X-ray and the cystogram.

Technique:

Preliminary drainage of the bladder was accomplished under local anesthesia using ½% novocain with 3 m. adrenalin (1:1000) to the ounce. On the date set for the second stage a hypodermic consisting of morphine sulphate gr. 1/6 and scopolamin gr. 1/250 to 1/150 was given one hour preceding operation. The room darkened and visitors excluded. To conserve time and to avoid disturbing the patient in the surgery, injections were done in the room 20 minutes before time for operation. This procedure allows: first, time for the injected solution to take effect; second, time for the operator, assistants and nurses to scrub; and third, time to transfer the patient into a prepared and quiet operating room.

In making the injections the anatomic types of sacra must be remembered. (Fig. II.) By turning the patient face downward on his bed and placing a pillow under the pelvis a convenient exposure is obtained. Palpating the posterior extremity of the ilium locates the posterior superior spine and a weal injected just below and externally overlies the second sacral foramen; passing the finger downward toward the crease in the buttocks identifies the posterior sacral cornu and a weal raised just below and externally overlies the fifth nerve exit. Two equidistant weals, that subdivide a line connecting the above points, will overlie the third and fourth foramen respectively. This procedure repeated on the opposite side indicates all trans-sacral injection points. A line connecting the right and left posterior sacral cornu forms the base of a triangle whose apex is the first segment of the coccyx; this triangle overlies the sacro-coccygeal membrane which is pierced in the caudal injection. The final weal is raised here. A column of ½% novocain is injected with a small calibre needle (26 gauge) from each weal down to the corresponding foramen or membrane. An empty needle (20 gauge—3 inches long) may be then introduced painlessly into each sacral foramen and through the sacral-coccygeal membrane into the sacral canal. If no blood or fluid escapes the novocaine is then slowly injected. We have routinely employed 1% freshly prepared sterile

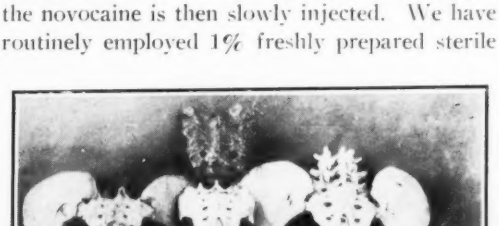

FIG. II.

THE SACRUM ANATOMIC TYPES.

novocain without adrenalin, injecting as follows: 20 to 30 c.c. in the caudal space and in the sacral, 10 c.c. at fifth, 9 c.c. at fourth, 8 c.c. at third and 7 c.c. at second on each side. A total of 88 to 100 c.c. of solution being used.

Fig. III illustrates the needles in position. The small pieces of adhesive overlie the bony landmarks indicated above. Where the needles have not entered a vessel (as indicated by blood flowing from its exposed end) and where the solutions have been injected slowly, we have seen no reactions. A few reactions encountered in a previous study was traceable to these causes.

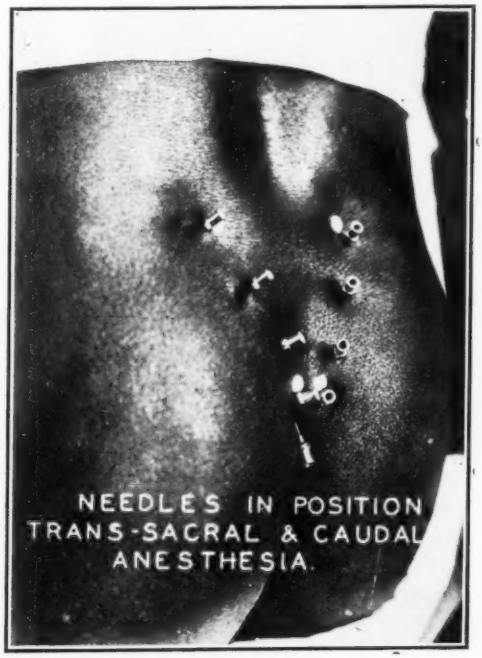

FIG. III.
NEEDLES IN POSITION, TRANS-SACRAL AND CAUDAL ANESTHESIA.

After injection the patient was turned promptly on his back and in 10 minutes transferred quietly to the surgery, wearing a cold damp cloth over the eyes. Here the abdomen was promptly prepared and the supra-pubic sinus and lower recti muscles anesthetised by the block method using ½% novocain with adrenalin (1:1000) 3 m. to the ounce. Large quantities of solution (100-125 c.c.) were deemed important.

Enucleation of a large adenomatous prostate (Fig. IV) is usually accomplished quickly and without disturbing the sleep into which the patient has usually fallen from his hypodermic. Smaller and more fibrous glands (Fig. V) are

FIG. IV.
PROSTATE—GENERAL HYPERTROPHY
The large type of adenoma is removed easily and without discomfort. The largest one in this series weighed 196 grams.

harder to remove and tearing through the urethra often induces temporary straining on the part of the patient. Sclerotic prostates and those containing calculi (Fig. VI) give the greatest percentage of imperfect results and failures from the standpoint of anesthesia. The time required in the operating room varies between 20 and 45 minutes with an average of 30 minutes in this series.

Stability of pulse, respiration and blood pressure observations before, during and after operation is gratifying to the big majority of prostatectomists who have employed regional anesthesia. Prompt and copious fluid intake by mouth often obviates the necessity of hypodermoclysis.

Operative Results:

Cases General Hypertrophy	28
Fibrosis	8
Median Bar	4
Total	40

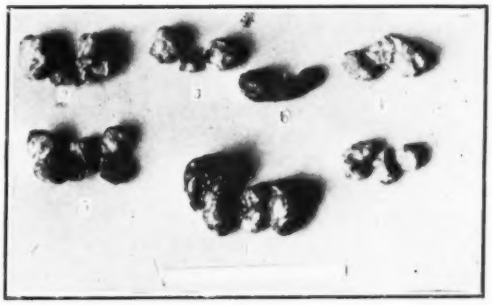

FIG. V.
GENERAL VIEWS—ADENOMATOUS AND FIBROUS PROSTATES.

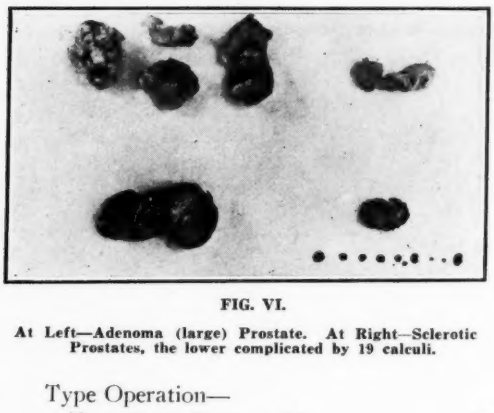

FIG. VI.

At Left—Adenoma (large) Prostate. At Right—Sclerotic Prostates, the lower complicated by 19 calculi.

Type Operation—	
Two Stage Supra-pubic	36
Cautery Punch	4
Total	40
Mortality—	
Cases operated	40
Cases recovered	38
Cases died	2
Per cent mortality	4.4
Morbidity—	
Postoperative Fistula	0
Postoperative Incontinence	0
Postoperative Hernia	1
Complications—	
Broncho-pneumonia (Died)	1
Septicemia (Died)	1
Epididymitis (mild)	10
Orchitis (suppurative)	1
Hemorrhage	1
Uremia	0
Anesthesia Results:	
Failed (general anesthesia given)	1
Fair (some pain)	2
Poor (considerable pain)	2
Excellent (including 15 that slept)	35
Total	40

Conclusions:

1. That trans-sacral and caudal injection is a distinct advance in the operative treatment of prostatic hypertrophy.

2. That in properly selected cases it is the anesthetic of choice.

3. That carefully administered it is safe.

4. That in a large percentage of cases the anesthesia is excellent.

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GRANULAR CALCIUM LACTO-PHOSPHATE SACCHARATED

GEORGE R. PLUMMER, M.D.,
Key West.

It is now conceded (Journal American Medical Association, October 3, 1925) that if calcium is furnished in sufficient quantity in the conditions for which it is indicated, cod liver oil, sunlight, or other measures in addition are not necessary. This, heretofore controversial point, being settled, there is only one other to be considered: the kind and quality of the calcium used. For intravenous injection only the chloride can be employed. And by the mouth the only logical form is the lacto-phosphate, because of its phosphorus content. As lime slakes in the air or is unstable in solution, it can only retain its potency and palatability by granulation with sugar. This simplifies its administration in a very satisfactory way. Physicians will find that where it is possible or necessary to administer calcium hypodermically once, they will give it by the mouth a hundred if not a thousand times. They need only one form, the granular, for this purpose, because it is readily soluble in water or may be swallowed straight. Probably the creation of granular calcium lacto-phosphate saccharated and its experimental use over a long period, and in many cases, to especially show its good effect in congestion of the lungs, when alcohol, its only supposed rival, is now discredited and legally barred, is an epoch making event in medicine. While not so sensational as the discovery of insulin, it will save more lives because of its wider applicability. Granular calcium is another step toward Medicine recovering its place beside Surgery from which it was dislodged by the discovery of Asepsis. As Nature does not furnish

a sufficient amount of calcium in ordinary food to supply the needs of the body in many conditions, it is evident that if it is supplied in a palatable, assimilable form in pregnancy, lactation, growing children, rickets, tetany, in acute wasting diseases to prevent debility and emaciation; in pneumonia and influenza to free the lungs from excessive secretion; in tuberculosis, and in hemorrhage from any cause, its effect on longevity is evident. Recently, an analysis of a number of makes of hypodermic tablets on the market showed they differed in strength from 30 to 70 per cent. and that was my experience when beginning the use of calcium. I found that in order to get the mineral with the necessary potency I had to have it specially manufactured, by what I consider the best chemical works in the world, and then granulated. The Army and Navy have dropped from their supply tables the hypophosphites because they were found to be absolutely inert, and I would like to suggest that you do not give the chloride by mouth because it is corrosive and poisonous, or any other form unless you investigate its chemical and physical condition. Only in this way will you give calcium a fair chance to show its effect. I could give from my case book a succession of cases of influenza, pleurisy, and pneumonia successfully treated with calcium, but prefer to describe my plan of treatment and let others try it if they will. The adult dose of granular calcium is two heaped teaspoons in half a glass of water every four hours and if administered early in the illness will mitigate all the symptoms and prevent some. The outstanding, astonishing thing is that it is a hypnotic, each dose causing sound refreshing sleep for four hours in a delirious patient. Even when there is pain it often avoids the use of morphine, although the latter is permissible when necessary. The blood in the sputum soon disappears, the fever lowers to a moderate point, and the cyanosis and breathing improve due to the prevention of osmosis into the lungs. Its action on the heart is ideal because it stimulates both the nerves and the heart muscle. In those cases which are not seen until well advanced and are so severe as to cause asphyxiation if the patient attempts to turn on either side, an additional small pillow placed under the right or left side of the face will give ease and facilitate sleep. Avoid annoying and disturbing with any kind of clay plaster, but a liniment of laudanum, aconite, and soap liniment is anodyne and satisfies the inherent instinct of mankind to rub something on the sick. No laxatives of any kind, especially castor oil. No baths or rubs of any description until the acute stage is passed, and then only limb by limb with a basin of tepid water with a tablespoon of bay rum. Five feedings a day: 7 a. m., orange juice, oatmeal or hominy, milk, coffee; 10 a. m., hot malted milk; 12 noon, chicken, squab or beef broth, rice, mashed potato, custard, milk, demitasse; 4 p. m., grape juice and water, half and half, with a teaspoon of sugar, vanilla crackers; 6 p. m., milk, tea, crackers or toast, jelly. If they don't have all of this they get well just the same, for granular calcium is both medicine and food.

SHALL PHARMACISTS SERVE PHYSICIANS?

SAMUEL S. DWORKIN,

Chairman Committee on Biologicals, National Association of Retail Druggists and American Pharmaceutical Association,

New York.

Biological products are becoming a greater factor in the modern materia medica every day.

Millions of patients are being treated with these products daily, and judging from the astounding results achieved by this form of medication, it is only in its infancy. Millions of dollars are being invested in research work in biological, chemical and pharmaceutical laboratories that represent an enormous capital investment.

Modern medicine in its scientific pursuits not only strives by these means to cure the scourge of many diseases that afflict mankind, but even greater attention is being given to the subject of preventive medicine as is shown by the extensive use of such biologicals as diphtheria toxin antitoxin mixture for immunization against diphtheria or authorized scarlet fever streptococcus toxin for active immunization against scarlet fever.

However, with all these advances in the science of medicine, little attention seems to have been given to the adequate and proper distribution of these important products.

It stands to reason that manufacturers of biologicals, chemicals and pharmaceuticals cannot maintain in addition to their research and manufacturing laboratories, distributing depots in all parts of the country where physicians can be promptly and efficiently served with their requirements day and night.

The question therefore arises, who shall be the logical distributor for biological products and other medicaments and what should be required of him?

A recent survey made throughout the United States reveals the fact that vast quantities of these products are being distributed in a more or less haphazard manner by supply houses who engage in this business largely in a commercial way only without any attempt to render a real professional service to the medical fraternity.

The proper storage under refrigeration, the prompt delivery of all orders, the selection and carrying stock of only products of the highest standards, the checking up of stocks of outdated potency, are only a few of the important duties that devolve upon the shoulders of the distributor.

Summing up all the factors that enter into the distribution of biological products, ampules for medication and other medicaments, who is better qualified and who should be looked to as the logical distributor of these products other than the professional pharmacist? The physician of today is one of the principal guardians of the public health and the professional pharmacist is the other.

It is most logical that there should be a closer bond of cooperation established between the medical and pharmaceutical professions if the well-being and health of the public at large are not to suffer.

Pharmacists are prepared and ready to serve physicians as professional men, and it is our belief that the medical fraternity will be served better, more efficiently and with a greater professional understanding if they will encourage pharmacists by looking to them as the logical distributors for biologicals, arsphenamines, insulin and medicaments of all kinds

The question of what the pharmacist should charge for his services as a distributor is one which also deserves discussion. As a rule, the professional pharmacist will only ask a fair percentage of profit to cover his overhead charges, such as rent, heat, light, clerk hire, maintenance of refrigeration, etc., on his sales to physicians for products to be used in their offices or for personal use.

However, too often when patients ask what the cost will be to them of certain medicaments prescribed for them, physicians unintentionally make the error of quoting the price at which they themselves buy these same products for their own use. We know this is not the general practice, but feel that in justice to the professional pharmacist, and the service he renders, this erroneous practice should be brought to the attention of the medical fraternity.

We believe every physician will grant that the professional pharmacist is entitled to a legitimate margin of profit in excess of his overhead charges on sales he makes to the consuming public, whether such represent physicians' prescriptions or other products.

As a matter of professional pride, from the standpoint of service and sound economics, we offer this suggestion and also in the hope that we may hear constructive suggestions and criticisms from our friends in the medical fraternity. A broad discussion of this problem in all its phases will be welcomed, either by direct correspondence or through the columns of this publication with the permission of its editor.

Our mottoes are "Live and help to live" and "He who serves most serves best."

WHAT SCIENCE MUST ACCOMPLISH

"The progress of medicine is the most important factor in the development of civilization. We ask from medicine the solution of the problems that are vital to the greatness and happiness of the human race.

"The purpose of medicine is to decrease human suffering by preventing disease or curing it. But this end cannot be reached except through a scientific understanding of the functions of the organism when modified by pathogenic factors.

"Scientifically organized hospitals and institutes for medical research, by merely continuing the investigations in which they are at present engaged, will immensely advance our knowledge of the nature and mechanism of disease. But fundamental principles have to be discovered; entirely new fields must be opened, and this can be accomplished only by pure science."—Alexis Carrel, The Modern Hospital, 26:299, (April) 1926.

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NINTH DISTRICT—DR. W. J. BLACKSHEAR . . . *Panama City*
Holmes, Washington, Bay.
TENTH DISTRICT—DR. HERMAN WATSON . . . . *Lakeland*
Polk.
ELEVENTH DISTRICT—DR. J. G. DUPUIS . . . *Lemon City*
Dade.
TWELFTH DISTRICT—DR. BAKER WHISNANT . . . *Fort Myers*
Glades, Charlotte, Hendry, Lee, Collier.
THIRTEENTH DISTRICT—DR. R. C. HUBBARD . . . *Tampa*
Hillsborough, Hernando, Pasco.
FOURTEENTH DISTRICT—DR. N. A. BALTZELL . . . *Marianna*
Calhoun, Jackson, Gulf.
FIFTEENTH DISTRICT—DR. JOHN E. HALL . *West Palm Beach*
Palm Beach, Broward.
SIXTEENTH DISTRICT—DR. M. M. HANNUM . . . . *Eustis*
Sumter, Lake.
SEVENTEENTH DISTRICT—DR. JOHN S. MCEWAN . *Orlando*
Osceola, Orange.
EIGHTEENTH DISTRICT—DR. S. G. HOLLINGSWORTH . *Bradenton*
Manatee, Sarasota.
NINETEENTH DISTRICT—DR. D. L. MCSWAIN . . . *Arcadia*
DeSoto, Hardee, Highlands.
TWENTIETH DISTRICT—DR. WM. R. WARREN . . . *Key West*
Monroe.
TWENTY-FIRST DISTRICT— . . . . . .
St. Lucie, Okeechobee, Indian River, Martin.

THE COMMITTEE ON NECROLOGY

For several years the Journal has depended on the secretaries of the county medical societies for obituary notices. This duty has been grossly neglected or abandoned by the county secretaries. During the past year the grim reaper has been particularly unmerciful to our membership, and we lost through death several of our most faithful and beloved brothers. Of these the Journal printed an obituary notice of only one, and that was written and sent in by a friend of the deceased.

With a view toward correcting this condition, and in order that the death of a member will be promptly reported to the Journal and an obituary published, a committee on necrology has been appointed, with a member in each section of the State, serving a certain defined district. It shall be his duty to report the death of any member in his district to the Editor of the Journal, and to obtain a proper obituary notice, or resolutions of the local society, and send to the

Journal with a photograph of the departed member. In this we earnestly request the cooperation of the County secretaries with the members of the Committee.

Any man who has spent his life in the practice of medicine and has been a loyal member of our Association, very richly deserves this last tribute which the Journal is so anxious to pay. It is sincerely hoped that the Committee will function and this very important feature will no longer be neglected.

H. Mason Smith, M.D.

THE DRIVE FOR MEMBERSHIP

The drive for the increase of membership which was so effectively started last year is being continued, and will reach its greatest momentum in the fall and winter.

The burden of this drive will fall heaviest on the Councilors, but the President is enlisting doctors over the State to assist the Councilors in this work. Beginning in September, the Councilors are expected to visit each County Society in their districts and do what they can toward improving and enlarging the societies and to organize societies in counties where there are none. Each Councilor will be furnished the names of doctors who are willing to go with him into these counties and assist in the organization work.

It is estimated that there are twelve hundred physicians in the State who should be in the Association, and the Association needs them. However, in our enthusiasm to increase our membership we should be careful not to take in one who does not measure up to the requirements of the Florida and American Medical Associations, but we want to get all who are entitled to the benefits of these organizations.

THE HOSPITAL COMMITTEE

At various times in the past a Hospital Committee has been in existence, which has collaborated with the Council on Medical Education and Hospitals of the American Medical Association. This Committee has done some very effective and valuable work in Florida in this connection.

This field offers more opportunity for constructive work during the developmental period of Florida than any other within the province of the Medical Association. The work has become of such important magnitude that a regular committee has been appointed to carry it on during the coming year.

The following physicians have been named to serve on this committee:

J. S. Helms, M.D., Chairman, Tampa.
J. E. Boyd, M.D., Jacksonville.
J. Q. Folmer, M.D., Chattahoochee.

H. M. S.

STATE NEWS ITEMS

LAKELAND'S NEW HOSPITAL

The City of Lakeland has just completed what is conceded to be the most modern type of hospital building and equipment to be found anywhere in the country.

It was largely due to the initiative of the Medical Fraternity of Polk County that the interest of the people was aroused, followed by an almost unanimous willingness on the part of the voters to provide ample and adequate hospital facilities, not only for Lakeland alone but for that large and thickly populated section of southwest Florida, of which Lakeland is the central point. Approximately three years were required in the way of a campaign of education which not only resulted in the creation of this present plant but in bringing into close ethical relationship the members of the medical fraternity, and incidentally establishing a very friendly attitude between the Polk County Medical Society and the people at large. In other words, the new Morrell Memorial Hospital marks an era of cooperation in this particular field of service that otherwise never could have existed. The people feel that Morrell Memorial Hospital is their hospital and that they have provided this avenue of service to the people through the medium of those engaged in the practice of medicine and surgery.

While not the largest building of its kind in the South, the new hospital, in the matter of convenience, substantial construction, modern facilities, and comforts for both patients and physicians, stands unequalled. In fact, it is the last word in hospital construction and equipment. Along with the building there is to be provided this year a residence for the Nurses' Staff and for the Student Nurses, to be erected at a cost of seventy-five thousand dollars for the building alone. The furnishings will be in keep-

ing with the handsome type of building to be erected, recognition being given by the people of Lakeland in voting an additional appropriation of the service rendered by the self-sacrificing women who are giving their lives, not for selfish gain but for the sake of humanity.

The entire investment in grounds, building and equipment will be approximately one-half million dollars and is planned to take care of one hundred patients.

The building is a combination of Spanish and Italian design. Reinforced concrete frame with hollow tile walls and stucco finish. The entire building is absolutely fire-proof, so far as human ingenuity can make it so. There are four stories, including the ground floor, or basement, and in addition, a roof garden over practically the entire area of the building proper. The location of this hospital is on the new northern entrance to Lakeland, known as the Lakeland Hills Boulevard, which is in reality a continuation of the State Highway No. 2, extending from the Georgia line through central Florida to Fort Myers. It overlooks the wide expanse of Lake Parker, one of Lakeland's numerous bodies of fresh water, and is the most conspicuous object brought to the traveler on entering the city from the north. The surrounding grounds are now being landscaped by an expert and will add tremendously to the attractiveness of the setting. The building itself is quite imposing with its wide and beautifully proportioned front, there appearing on the main wall, in iron letters, the name of the institution.

A wide driveway branches from the main entrance and continues to the rear of the hospital, where ambulances enter a covered porch-way and where the patients are removed and, unless emergency cases, can be placed on the beds which they are to occupy while in the hospital. They are then taken to the elevator and to the private room or ward set aside for their accommodation. Emergency cases are removed to the emergency room where facilities are available for prompt attention, such as a marble wash slab, sterilizer, and other equipment there available. The patients so treated are then removed to the place set aside for them in the hospital, or can be taken directly to the operating rooms on the third floor.

On the south wing of the ground floor are the dining rooms for the nurses' staff, both permanent and student, all nicely furnished and extremely comfortable. Here are also the refrigerating and heating plants in addition to the electrical equipment, all of the very latest type. The kitchen is in the west wing and is the last word in the matter of equipment and convenience. It is electrically operated throughout, but with gas and steam connections. From a sanitary and technical standpoint it is rated perfect. In the northern wing of this floor is the pathological laboratory and the assembly rooms for nurses' class work. Also a quiet room and family room for patients dying, where the family may assemble at the bedside without interfering with the routine of the hospital.

The first or main floor is reached by a wide terrace and tier of tiled steps. The entrance itself is exceedingly pleasing, there being a rotunda, on the north side a reception room for patients coming in and waiting. On the left are the offices of the superintendent and the executive staff, together with the general information office. On this and the other three floors run long corridors from one end of the building to the other, terminating at either end in wide open sun-parlors. On this main floor are the wards, medical and surgical and children's wards. They are all furnished with the latest type Gatch Bed.

The third floor contains the private rooms, twelve of which have private baths, with the same type of equipment throughout.

In the north wing of the fourth floor is the Surgical Department, entirely shut off from the other part of the building, where are located two of the finest operating rooms of any hospital in this country, both in the matter of light and equipment. In addition to this they have an eye, ear, nose and throat operating room, with sterilizing rooms, nurses' rooms, doctors' locker-rooms and scrub rooms. Immediately adjoining this is the X-ray Department, fully equipped in the very latest X-ray laboratory. On the west wing is the Delivery room, Nursery and Obstetrical Department.

One feature of the Morrell Memorial Hospital that is quite unusual and that gives it a distinction is a roof garden, which has been so planned that patients can readily be taken from their rooms or wards to the roof, not alone for the fresh air and sunshine, but for the exhilarating effect of one of the most beautiful panoramas of lake, groves, hills and driveways to be found anywhere. Another feature that is quite unusual, and is the result of the thoughtful interests

of the Rotary of Lakeland in cooperation with the City authorities, is the installation of a Radio system by which every patient in the hospital will have the enjoyment of radio programs through the simple adjustment of a head-piece placed at each bed. In addition to this are loud speakers located in all the sun-parlors and on the roof garden.

LUNCHEON PRECEDED OPENING

A few days before the actual opening occurred the City of Lakeland entertained at luncheon at Cleveland Heights Club House the members of the Polk County Medical Society and the Polk County Press Association. This was attended by some fifty leading men of both professions, the occasion being a most happy one, bringing together as it did many of the most prominent surgeons and physicians in Tampa, Ocala, Jacksonville, Orlando, Plant City, Fort Myers and from all parts of Polk County.

Doctor E. B. Milam, of Jacksonville, accompanied by his wife and children, left recently for a visit in Kentucky. Following this, Doctor Milam expects to spend several months at the New York Post Graduate school doing special work in Gastro-Enterology. Doctor Milam will be absent from Jacksonville about two months.

Doctor M. A. Lischkoff, of Pensacola, is spending the summer in Europe. He expects to visit the ear, nose and throat clinics in London, Paris, and Vienna. During his absence from Pensacola, Doctor C. J. Heinberg, who is associated with him, is looking after his practice.

Born to Doctor and Mrs. E. F. Carter, 2702 Jetton Avenue, Tampa, Barbara Clair Carter, May 24, 1926.

Doctor George E. Weems, of Apalachicola, was a recent visitor in Jacksonville.

Doctor H. Marshall Taylor, of Jacksonville, has just returned from attending the meetings of the American Otological Society and the American Laryngological Society held in Montreal, Canada.

While at the Gainesville meeting, a number of men got together and organized the Florida State Medical Golfers' Association. The following officers were elected: Joseph Halton, Sarasota, president; J. S. McEwan, Orlando, vice-president; W. M. Manning, Jacksonville, secretary; and Joseph Taylor, Tampa, treasurer. The membership fee is $1.00. All golfers who are members of the Florida Medical Association are requested to become members of this Association, remitting $1.00 membership fee to Joseph Taylor, M.D., Tampa, Florida. At the meeting next year at West Palm Beach, a three-day tournament will be held and all members are urged to bring their golf clubs. On the evening of the third day, a stag dinner will be held at which the prizes will be presented.

The regular monthly meeting of the Volusia County Medical Society was held at Daytona Beach on May 18th. Doctor S. R. Norris and Doctor L. W. Holloway from Jacksonville were visitors at the Society. Doctor Norris read a paper, the title of which was "The Conduct of Labor." The paper was followed by a general discussion by members of the Society.

Doctor and Mrs. J. C. Chandler, of Tampa, attended commencement exercises at Riverside Military Academy, Atlanta, Georgia. They spent several days in Athens, Georgia, the home of Doctor Chandler.

Doctor J. C. Davis, Jr., of Quincy, Florida, served as a fraternal delegate at the meeting of the Georgia Medical Association which held its meeting at Albany, Georgia, during the past month. This custom of appointing fraternal delegates by the Georgia and Florida Medical Associations will tend to bring about a kindlier feeling between the respective Associations and will be instrumental in stimulating an understanding between the organizations of these States.

Doctor C. H. Farmer, who for the past few months has been connected with the Florida State Board of Health in the capacity of Medical Officer for the Jacksonville District, left the State Board of Health on May 15th to begin the practice of medicine in Lakeland, Florida. For the past three years he has been connected with the South Carolina State Board of Health. On moving to Lakeland, Doctor Farmer will be associated with Drs. C. W. Love and George C. Overstreet, with offices in the Marble Arcade.

Doctor G. C. Kingsbury, practicing physician at Largo, Florida, died suddenly Wednesday, May 19, 1926, at the age of sixty-seven. Doctor Kingsbury graduated from the Miami Medical College of Cincinnati, Ohio, in 1880 and was licensed to practice medicine in this State in 1908. He was a member of the Pinellas County Medical Society and a Fellow in the American Medical Association.

Doctor Blackburn W. Lowry, of Tampa, is visiting his mother who is confined to a hospital in Philadelphia. Doctor Lowry expects to visit New York while on this trip.

The Women's Auxiliary of the State Medical Association, organized at Gainesville, should be a great help to organized medicine in the State. A Chapter of this organization should be organized in each county where there is a component society. They should be represented at the next State Medical Association, where regular meetings will be held, with committee reports, and other things of vital interest to the Medical Association. The ladies should by all means encourage membership in the county societies and attendance at the State meetings.

The president of the Medical Association, together with the former president, are heartily in favor of this organization and are looking forward to its being a great help in carrying out local and state policies which they hope to promote during the coming year.

We hope Mrs. Lassiter, of Gainesville, who was elected president, will not lose any time in getting her organization in working order so that our next meeting in West Palm Beach will be the greatest of State meetings for organized medicine in Florida. Many State Medical Associations have well-organized Auxiliaries, so why not Florida?

Doctor Earl H. McRay, of Tampa, is in Baltimore, being called there on account of the ill health of his father.

The executive committee of the Association, consisting of Doctor G. R. Holden, chairman, Jacksonville, Doctor Sheldon Stringer, Tampa, and Doctor C. D. Christ, Orlando, met in session in Jacksonville, May 25th. Many matters pertaining to the administration of the State Association were discussed. The most important matter to come before this committee was the matter of payment of past obligations to the Record Printing Company. Payment was arranged for, and the Association is out of debt for the first time since 1914. A full report of this indebtedness was contained in the secretary-treasurer's report as presented at the annual meeting in Gainesville.

STATE BOARD OF HEALTH NOTES

At the conference of State and Provincial Health Authorities of North America, held at Atlantic City May 21 and 22, 1926, Dr. M. M. Seymour, Health Officer of Saskatchewan, the President of the Conference, in his address, suggested that a country-wide immunization program be staged against diphtheria, smallpox and typhoid. His suggestion was approved, and it was unanimously resolved that with the opening of the schools in September the program would be commenced, and that diphtheria immunization would be carried on during September and October. That following this a campaign against smallpox would be waged in November and December, and that during January and February, 1927, the fight against typhoid would be carried on.

By making this a country-wide plan much good should be accomplished.

At the meeting of the Florida League of Municipalities, at Pensacola, June 2 and 3, this matter was discussed and the League voiced its approval and support of the program.

These are diseases we know how to prevent, hence, a case of any of them indicates a lack of civic pride on the part of the patient or the one responsible for the health of that individual.

Every physician in the State can help his patients and his community by calling this campaign to the attention of those with whom he comes in contact.

Remember, the State Board of Health furnishes the material for immunization, and you may get it by writing the nearest laboratory, but requests for any large amount should be addressed to the laboratory at 2nd and Julia Sts., Jacksonville, as that is the main distributing point.

Dr. J. R. Bean, Director of the Bureau of Laboratories, has been at the point of death in Walter Reed Hospital following an operation for brain tumor at Johns Hopkins Hospital in April. Until a very short time before he went for operation no one suspected his condition, and the knowledge of it came to us as a great shock.

SCHEDULE OF MEETINGS—COMPONENT SOCIETIES
FLORIDA MEDICAL ASSOCIATION

		MEETINGS			
County Society	Secretary	Date	Time	Place	Luncheon?
Alachua	W. Lassiter, M.D., Gainesville.				
Bay	J. M. Nixon, M.D., Panama City.				
Bradford	Seeber King, M.D., Lake Butler.				
Brevard	R. D. Ferguson, M.D., Titusville.				
Broward	R. Hippensteel, M.D., Ft. Lauderdale.	Monthly	8:00 P.M.	Ft. Lauderdale High School	No.
Columbia	L. J. Arnold, M.D., Lake City.				
Dade	G. Raap, M.D., Miami.	1st Friday	8:30 P.M.	Miami City Club	Occasionally.
DeSoto	C. H. Kirkpatrick, M.D., Arcadia.			Hospital	No.
Duval	Louie Limbaugh, M.D., Jacksonville.	1st Tuesday	8:15 P.M.	Arnold-Edw. Auditorium	No.
Escambia	Herbert D. Snyder, M.D., Pensacola.	1st Tuesday	8:00 P.M.	Board of Health Building	No.
Hillsboro	B. W. Lowry, M.D., Tampa.	1st and 3rd Tuesdays	8:00 P.M.	City Hall	No.
Jackson	R. L. Kennedy, M.D., Malone.	2nd Tuesday	3:00 P.M.	Marianna	No.
Lake	S. C. Colley, M.D., Tavares.	2nd Monday	12:30 P.M.	Biltavern Hotel	Yes.
Lee	H. Quillian Jones, M.D., Ft. Myers.	3rd Friday	7:30 P.M.	Lee Memorial Hospital	No.
Leon-Gadsden	F. Clifton Moor, M.D., Tallahassee.	Quarterly	3:00 P.M.	Varies	Yes.
Manatee	J. M. Davis, M.D., Bradenton.				
Marion	J. L. Chalker, M.D., Ocala.	3rd Thursday	12:30 P.M.	Harrington Hotel	Yes.
Monroe	G. R. Plummer, M.D., Key West.				
Orange	M. M. Andrews, M.D., Orlando.	3rd Wednesday	8:30 P.M.	Announced	No.
Palm Beach	W. O. Arnold, M.D., W. Palm Beach.	2nd Monday	8:00 P.M.	Varies	Yes.
Pasco	T. F. Jackson, M.D., Dade City.	2nd Tuesday	8:00 P.M.	Varies	Yes.
Pinellas	O. O. Feaster, M.D., St. Petersburg.	Every 2nd Friday	8:00 P.M.	Fla. Art School	No.
Polk	Herman Watson, M.D., Lakeland.	2nd Wednesday in Feb., Apr. June, Aug. Oct., Dec.		Lakeland	Yes.
St. Johns	I. M. Hay, M.D., St. Augustine.				
St. Lucie-Okeechobee	G. C. Hardie, M.D., Ft. Pierce.				
Sarasota	F. Metzger, M.D., Sarasota.				
Sumter	W. E. Mitchell, M.D., Coleman.	Monthly			No.
Taylor	R. J. Greene, M.D., Perry.	Last Thursday	12:15 P.M.	Eldorado Cafe	Yes.
Volusia	R. L. Miller, M.D., Daytona Beach.	2nd Tuesday	7:30 P.M.	Varies	Yes.
Walton	D. H. Simmons, M.D., DeFuniak Springs.	3rd Thursday	8:00 P.M.	Varies	Occasionally.

NOTE
(Secretaries: Please submit information to complete the above schedule.)

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